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VOL. 25 NO. 8 February 21, 1975

Cooperative Economic Insect Report

Issued by
PLANT PROTECTION AND QUARANTINE PROGRAMS
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
U.S. DEPARTMENT OF AGRICULTURE

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CURRENT SERIAL RECORDS

ANIMAL AND PLANT HEALTH INSPECTION SERVICE
PLANT PROTECTION AND QUARANTINE PROGRAMS
PEST SURVEY AND TECHNICAL SUPPORT STAFF

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Service serves as a clearing house and does not assume responsibility for accuracy of the material.

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CEIR
Pest Survey and Technical Support Staff
Plant Protection and Quarantine Programs
Animal and Plant Health Inspection Service
United States Department of Agriculture
Federal Center Building
Hyattsville, Maryland 20782

Volume 25 February 21, 1975 Number 8

COOPERATIVE ECONOMIC INSECT REPORT

HIGHLIGHTS

Current Conditions

GREENBUG ranged up to heavy in wheat in north-central Texas, with some controls applied. (p. 79).

No cases of SCREWWORM reported in the United States during 14-day period ending February 8. (p. 80).

Detection

AN ANOBIID BEETLE reported for first time in Mississippi. This is first report of this species since original description from specimens collected in Texas prior to 1905. (p. 82).

For new county and island records see page 82.

Some First Appearances of the Season

ALFALFA WEEVIL larvae in Kansas and Indiana. PEA APHID in New Mexico and Arkansas. VELVETBEAN CATERPILLAR in Florida. PEAR PSYLLA in Oregon.

Special Reports

Summary of Insect Conditions in Hawaii - 1974. (pp. 84-86).

"Lovebugs," a Review of the Nearctic Species of Plecia Wiedemann (Diptera: Bibionidae). (pp. 87-91).

Imported Fire Ant Quarantines. Map. Centerfold.

Reports in this issue are for week ending February 14 unless otherwise indicated.

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WEATHER OF THE WEEK ENDING FEBRUARY 17

Reprinted from Weekly Weather and Crop Bulletin supplied by National Weather Service, NOAA.

HIGHLIGHTS: As the week began, a High pressure system dominating the Eastern United States painted clear blue skies from the Mississippi River eastward except for the Gulf Coast States and the Great Lakes region. By week's end, the entire weather picture changed, with rain falling across the South and East while extremely turbulent weather plagued the Gulf Coast States.

PRECIPITATION: Some precipitation fell across most of the Nation last week. Heaviest amounts soaked the central Gulf Coast States where 3 to 4 inches were common. The rain storms were peppered with thunderstorms towards the week's end. Upslope flow from the Dakotas westward into the mountains caused light snow in that area on nearly every day of the week. Monday, a High pressure system centered in northern Virginia dominated the Eastern U.S. producing clear skies from the Mississippi River eastward except for the gulf coast and Great Lakes area. A series of Low pressure storm systems hovered over the entire area from Washington State throughout the Rocky Mountains. Heavy snow continued over the northern Rockies. Rain fell on the west coast extending as far south as central California. The northern Virginia High pressure system moved rapidly into the Atlantic on Tuesday. Meanwhile, a Low over Oklahoma brought rain and rain showers to the east of it with freezing rain creeping northward into Kansas. By Wednesday, the Low from Oklahoma had moved to West Virginia triggering rain and rain showers ahead of it through Maryland and snow in Pennsylvania, Ohio, and New York. Snowfalls of as much as 5 inches were reported in Pennsylvania during the morning. New York was covered with 5 to 7 inches of snow, the greatest depth in more than 4 years for New York City.

Weather of the week continued on page 92.

SPECIAL INSECTS OF REGIONAL SIGNIFICANCE

ARMY CUTWORM (Euxoa auxiliaris) - KANSAS - Trace second-instar larval populations found in some southwest area wheatfields. Ranged as follows per square foot in 4 to 6-inch wheat by county (4 fields per county): Seward 0-0.2, Stevens 0-0.2, Meade and Morton zero. (Bell).

CORN LEAF APHID (Rhopalosiphum maidis) - NEW MEXICO - Light on barley, averaged one per square foot, near Roswell, Chaves County. (N.M. Coop. Rpt.). KENTUCKY - Problem earlier in year on winter wheat in western area. Now replaced by Rhopalosiphum padi Many fields show yellowing in western areas. (Barnett, Raney).

GREENBUG (Schizaphis graminum) - TEXAS - Activity light to moderate in small grains in Clay and Young Counties; counts ranged up to 70 per drill row foot. Light to heavy, ranged 5-300 per drill row foot, in Archer, Baylor, Hardeman, Haskell, Jones, Knox, Throckmorton, Wichita, and Wilbarger Counties. Controls applied in parts of Archer, Baylor, Hardeman, Jones, and Wilbarger Counties. Parasitic wasps noted feeding on greenbug in several fields in Hardeman and Wilbarger Counties. Up to 10 parasitized greenbugs per row foot noted. Spiders observed preying on greenbug in some Hardeman County fields. (Boring).

OKLAHOMA - Greenbug ranged 40-50 per linear foot in Washita County wheat. Ranged 10-20 per linear foot in wheat in Beckham and Roger Mills Counties. (Okla. Coop. Sur.). KANSAS - Infestations ranged none to light in 4 to 6-inch wheat in 4 southwest district counties. Counts per drill row foot ranged as follows by county (4 fields per county): Stevens trace-25, Meade 0-12, Morton and Seward zero to trace. (Bell). ARKANSAS - Occasional specimen observed in northwest area wheat. (Boyer).

SMALL GRAINS

ENGLISH GRAIN APHID (Macrosiphum avenae) - ARKANSAS - Trace populations observed on northwest area wheat. (Boyer).

AN APHID (Rhopalosiphum padi) - TEXAS - Light, 75 per drill row foot, reported from several small grain fields in Hardeman and Wilbarger Counties. (Boring). OKLAHOMA - Light on small grains in Washita, Beckham, and Roger Mills Counties. (Okla. Coop. Sur.).

FORAGE LEGUMES

ALFALFA WEEVIL (Hypera postica) - KANSAS - Egg hatch light in Chautauqua County alfalfa. First-instar larvae averaged 0.3 on 20 percent of 2-inch green stems. Dead larvae, believed frozen, also averaged about 0.3 per stem, some had reached second and third instar. (Bell). MISSOURI - Alfalfa samples collected in northeast area during January revealed averages of 47 eggs per square foot in Knox County and 92.5 in Clark County. (Munson). ILLINOIS - Eggs ranged 20-290 per square foot in Washington County alfalfa. Some first, second, and third-instar larvae found in stem samples. (Ill. Ins. Rpt.). INDIANA - Egg surveys conducted during period January 27 through February 3 showed mean number of eggs per square foot ranged 53-811 in 13 alfalfa fields in 9 counties. (Meyer).

PEA APHID (Acyrthosiphon pisum) - NEW MEXICO - Ranged 2-4 per square foot on young alfalfa near Roswell, Chaves County. (N.M. Coop. Rpt.). ARKANSAS - Trace populations found on vetch at location in Washington County. (Boyer).

VELVETBEAN CATERPILLAR (Anticarsia gemmatalis) - FLORIDA - Eight third-instar larvae collected in 200 sweeps of alfalfa at Gainesville, Alachua County. This is first report of season. (Fla. Coop. Sur.).

COTTON

BOLL WEEVIL (Anthonomus grandis) - SOUTH CAROLINA - Loss plus cost of control on 295,000 acres in 1974 estimated at 11,866,000 dollars. This represents a decrease on about the same acreage as in 1973. The decrease in mainly due to decrease in average per unit price of cotton. (McCaskill).

DECIDUOUS FRUITS AND NUTS

PEAR PSYLLA (Psylla pyricola) - OREGON - Overwintered well in pear-producing areas of Jackson County. Some pretreatment populations ranged 35-40 per tray. Most psyllids emerged first part of current period but no eggs noted. Some hardshells still present. (Berry). Dormant treatments applied to Douglas County pears and post-treatment evaluations in progress. (Passon). Emergence also noted in Hood River area, Hood River County. Female dissection showed 10 percent with mature eggs. This, along with warm temperatures, indicates some egg deposition probably underway. (Fields).

ORNAMENTALS

TEA SCALE (Fiorinia theae) - ALABAMA - Numerous Burford holly plants used as border shrubs at Mobile, Mobile County, about dead due to heavy infestation. This scale insect still major pest of Burford holly, camellia, and sasanqua statewide. (Lockhart et al.).

FOREST AND SHADE TREES

SOUTHERN PINE BEETLE (Dendroctonus frontalis) - WEST VIRGINIA - Damaged about 60 acres of scattered Virginia pine at East Lynn Lake, Wayne County. Collected January 13, 1975, by W.G. Coleman. Determined by A.R. Miller. This is a new county record. (Hacker).

NANTUCKET PINE TIP MOTH (Rhyacionia frustrana) - KENTUCKY - Damage to pines ranged scattered to continuous in Ohio County. In areas of heavy infestation, 70 percent of twig tips damaged. (Barnett).

DOGWOOD BORER (Synanthedon scitula) - ALABAMA - About 50 percent of 100+ dogwood trees observed in Lee County infested; borers feeding on cambium beneath bark. Most larvae about full grown. Birds have fed on larvae. This exposes fresh new bark which will attract more moths during spring emergence for additional oviposition. This is usual pattern of reinfestation. (McQueen).

MAN AND ANIMALS

SCREWWORM (Cochliomyia hominivorax) - No cases reported from continental U.S. during period January 26-February 8. Total of 131 cases reported from Mexico. Sterile flies released in U.S. this period totaled 42,197,000; all released in Texas. Total of 205,288,000 sterile flies released in Mexico. (Vet. Serv.).

CATTLE GRUBS (Hypoderma spp.) - KANSAS - Percent of cattle discounted in Seward County due to grub damage decreased significantly during first week of February (0.56 percent) as compared to most of January (about 7 percent). (Bell). KENTUCKY - H. lineatum (common cattle grub) larvae averaged 3.8 per animal on backs of 21 Holstein dairy cows of various ages in Fayette County. (Barnett).

SHEEP BITING LOUSE (Bovicola ovis) - WEST VIRGINIA - All stages heavily infested 60 head of sheep in Monongalia County. (Weaver).

FEDERAL AND STATE PLANT PROTECTION PROGRAMS

ORIENTAL FRUIT FLY (Dacus dorsalis) - CALIFORNIA - All surveys negative for several weeks in San Diego County. Female annihilation treatment area reduced to four-square-mile area. Male annihilation treatment will continue into early April unless additional flies caught. (Cal. Coop. Rpt.).

RED IMPORTED FIRE ANT (Solenopsis invicta) - FLORIDA - Adults noted in 2 mounds on southeast section and one mound about 12 inches high on northeast section of property at Plantation, Broward County, February 7, 1975. Adults infested about 50 acres of roadside area adjacent to golf course and present in vacant field at Sunrise, Broward County, on same date. (Fla. Coop. Sur.).

WEST INDIAN SUGARCANE ROOT BORER (Diaprepes abbreviatus) - FLORIDA - Larvae moderately infested one of 15 schefflera (Brassaia actinophylla) plants examined in nursery at Goulds, Dade County. Collected January 13, 1975, by W.E. Wyles. Determined by J.B. Beavers. This is a new county record. Larvae moderate on roots and in soil on 4 of 6 schefflera plants checked at a nursery in Goulds January 17, 1975, by W.E. Wyles. Larvae light on roots and in soil of one adonidia palm (Veitchia merrilli) checked at nursery in Homestead, Dade County, January 17, 1975, by W.E. Wyles. Larvae and pupae heavily infested roots and soil of 12 schefflera plants of 20 examined at nursery in Davie, Broward County, January 19, 1975, by R.L. Chavez. All determined by J.B. Beavers. Adults moderate in soil around one of 20 schefflera plants checked by R.L. Chavez January 19, 1975, at nursery in Davie. Determined by R.E. Woodruff. (Fla. Coop. Sur.).

CORRECTIONS

CEIR 25(6):40 - ORNAMENTALS - AN ARMORED SCALE (Pseudaulacaspis cockerelli) - TENNESSEE - "... Collected and determined by C.R. Patrick..." should read: "... Collected by C.R. Patrick. Determined by D.R. Miller. This is a new State record. (Gordon)."

LIGHT TRAP COLLECTIONS

ARIZONA - Mesa, 2/3-9, BL, ARMY CUTWORM (Euxoa auxiliaris) 2, BEET ARMYWORM (Spodoptera exigua) 18, CABBAGE LOOPER (Trichoplusia ni) 1. VARIEGATED CUTWORM (Peridroma saucia) 53, YELLOWSTRIPED ARMYWORM (S. ornithogalli) 7. FLORIDA - ARMYWORM (Pseudaletia unipuncta) 1, BLACK CUTWORM (Agrotis ipsilon) 2, FALL ARMYWORM (Spodoptera frugiperda) 1, GRANULATE CUTWORM (Feltia subterranea) 49, SALTMARSH CATERPILLAR (Estigmene acrea) 1.

DETECTION

New State Record

AN ANOBIID BEETLE (Petalium schwarzi) - MISSISSIPPI - Three specimens from 5 lots of Petalium sorted from light trap collections determined this species by E.J. Ford, Jr. Collections made during May and June 1968 at Southern Forest Experiment Station, Forest Service, USDA, near Gulfport, Harrison County, by L.H. Williams. Until now, the only known specimens of P. schwarzi were those collected by E.A. Schwarz sometime before 1905 at Victoria, Texas. The species was described by H.C. Fall in 1905, but the year Schwarz collected the original specimens is not available. It was probably about 1902. In addition to being a new State record, it is noteworthy that P. schwarzi has not been collected and identified in more than 70 years and that it is not limited to one small ecological niche. For additional information see USDA, ARS, Tech. Bul. No. 1467, p. 13. (Ford).

New County and Island Records - A LADY BEETLE (Coccinella septempunctata var. brucki) HAWAII - Hawaii Island, Moloaa (p. 83). SOUTHERN PINE BEETLE (Dendroctonus frontalis) WEST VIRGINIA - Wayne (p. 80). A STINK BUG (Plautia stali) HAWAII - Hawaii Island (p. 83). WEST INDIAN SUGARCANE ROOT BORER (Diaprepes abbreviatus) FLORIDA - Dade (p. 81).

HAWAII INSECT REPORT

General Vegetables - BEET ARMYWORM (*Spodoptera exigua*) caused light damage to green onions throughout Waianae, Oahu; less than 10 percent of plants infested. Much decrease in damage noted past 30 days. BEAN FLY (*Ophiomyia phaseoli*) ranged light to moderate in home plantings of yardlong beans at Waikapu, Puunene, and Wailuku, Maui, during January. Infestation levels were 1, 8, and 30 percent at these respective locations. No parasites or *O. phaseoli* emerged from infested material collected at Waikapu and Puunene, but parasitism was 90+ percent in material collected at Wailuku; 80 percent by *Opius importatus* (a braconid wasp) and 13 percent by *Halticoptera patellana* (a pteromalid wasp). Yardlong bean is used as index plant since it is present in most localities and is highly preferred host. (Miyahira, Ah Sam).

Fruits and Ornamentals - Another adult of a NOCTUID MOTH (*Anua indiscriminata*) collected at Nawiliwili, Kauai, during January 1975. This is second specimen for Kauai. Location about 10-15 miles from Kapaa, where first specimen collected. (Sugawa). See CEIR 25(1-5):11, 1975. (PPQ). Surveys for BANANA SKIPPER (*Erionota thrax*) conducted during January on Kauai indicate infestation levels at 10 percent or less throughout most areas. Damage heavier at Mana (40 percent) and at Kaumakani (15 percent). No parasites recovered. Egg and larval parasite releases made weekly. (Ragasa, Melendez). An adult of a STINK BUG (*Plautia stali*) collected at Kahului, Maui, January 28, 1975, by N. Miyahira. Several adults found in blacklight trap collections during January 1975 at Hilo airport, Hawaii Island. These are new island records. *P. stali* now recorded from Oahu, Molokai, Maui, and Hawaii Islands. (Beardsley). See CEIR 18(14):261, 1968, for first report in State. (PPQ).

Beneficial Insects - Several adults of a LADY BEETLE (*Coccinella septempunctata* var. *brucki*) collected at Kilauea Crater, Volcano National Park, Hawaii Island, during week ending January 24 by J. Leeper and several students. This is a new island record. Species purposely introduced from Okinawa in 1958 for aphid control. Found established on Oahu in October 1969. Adults first released on Hawaii Island at Hilo, Keeau, and Pahala in April 1973. (Leeper). Several adults observed feeding on aphids at Koloa, Kauai, and one adult observed at Moloaa, both during week ending February 14, 1975. This is a new island record. This lady beetle was first released at Kaumakani Community Garden in April 1974, and this is the first recovery. (Sugawa).

SUMMARY OF INSECT CONDITIONS IN HAWAII - 1974

Detection

Nine species were reported as new to the United States. These were ORANGE SPINY WHITEFLY (*Aleurocanthus spiniferus*), OLEANDER HAWK MOTH (*Deilephila nerii*), 2 NOCTUID MOTHS (*Anua indiscriminata* and *Leucania loreyi*), a MUSCID FLY (*Atherigona reversura*), a LEAFHOPPER (*Balclutha rufofasciata*), a LADY BEETLE (*Brumoides suturalis*), a PTEROMALID WASP (*Cerocephala dinoderi*), and a LYGAEID BUG (*Cligenes marianensis*), all on Oahu Island. None of these are known to occur on the continental U.S.

Other species recorded for the first time in the State during 1974 were an APHID (*Acyrthosiphon pelargonii zerozalphum*), a MANTID (*Brunneria borealis*), a SYRPHID FLY (*Scaeva pyrastri*), a CERAMBYCID BEETLE (*Semanotus amethystinus*), a SPHYNGID MOTH (*Theretra nessus*), and a LEAFHOPPER (*Zyginia penapacha*). Also recorded for the first time in the State were two genera of Coleoptera, *Meristhus* (Elateridae) and *Selenophorus* (Carabidae), and one genus of Hemiptera, *Stenotus* (Miridae).

General Vegetables

TOMATO PINWORM (*Keiferia lycopersicella*) infestations were variabl in tomato, potato, and eggplant. Damage was heavy on tomato on Hawaii and Maui Islands and severe on potato on Hawaii Island. BEAN FLY (*Ophiomyia phaseoli*) infestations were variable in backyark plantings of snap and long beans throughout the State. Damage was occasionally heavy in commercial snap bean and soybean crops. Bean fly is easily controlled with timely applications of recommended insecticides. *Opius* spp. (braconid wasps) and *Halticoptera patellana* (a pteromalid wasp) exerted control of this pest in backyard bean plantings. DIAMONDBACK MOTH (*Plutella xylostella*) larvae ranged light to heavy on cruciferous crops throughout the State. Infestations ranged light to moderate on watercress at Pearl City, Oahu. BEET ARMYWORM (*Spodoptera exigua*) infestations remained light most of the year, but did range moderate to heavy periodically during late summer. Continual spray programs appeared necessary for control. CARMINE SPIDER MITE (*Tetranychus cinnabarinus*) ranged moderate to heavy in most host crops sometime during the year. Many heavy infestations could have been prevented by timely acaricide applications. This spider mite was also heavy on papaya, but *Stethorus siphonulus* (a lady beetle) when present, did much to decrease populations. ONION THRIPS (*Thrips tabaci*) was generally light to moderate on Manoa lettuce throughout Oahu. Control appeared very difficult due to the physical nature of the plant. Control problems have aggravated an already acute problem of spotted wilt disease. Thrips damage was of relatively minor importance compared to that of disease transmission. GREENHOUSE WHITEFLY (*Trialeurodes vaporariorum*) infestations in commercial tomato, bean, cucumber, and squash crops were generally nonexistant throughout the year. Occasional outbreaks were easily controlled. Infestations in commercial eggplant crops and in home plantings of the above mentioned crops were occasionally moderate to heavy. General-use insecticides were apparently not effective.

THE FOLLOWING REGULATED ARTICLES REQUIRE A CERTIFICATE OR PERMIT YEAR-ROUND EXCEPT AS INDICATED:

1. Soil, separately or with other things.

   Soil samples shipped to approved laboratories do not require attachment of certificate or permit.*

   Potting soil is exempt if commercially prepared, packaged, and shipped in original containers.

2. Plants with roots with soil attached except houseplants grown in the home and not for sale are not regulated.

3. Grass sod.

4. Hay and straw.

   Hay and straw are exempt if used for packing or or bedding.

5. Used mechanized soil-moving equipment.

   Used mechanized soil-moving equipment is exempt** if

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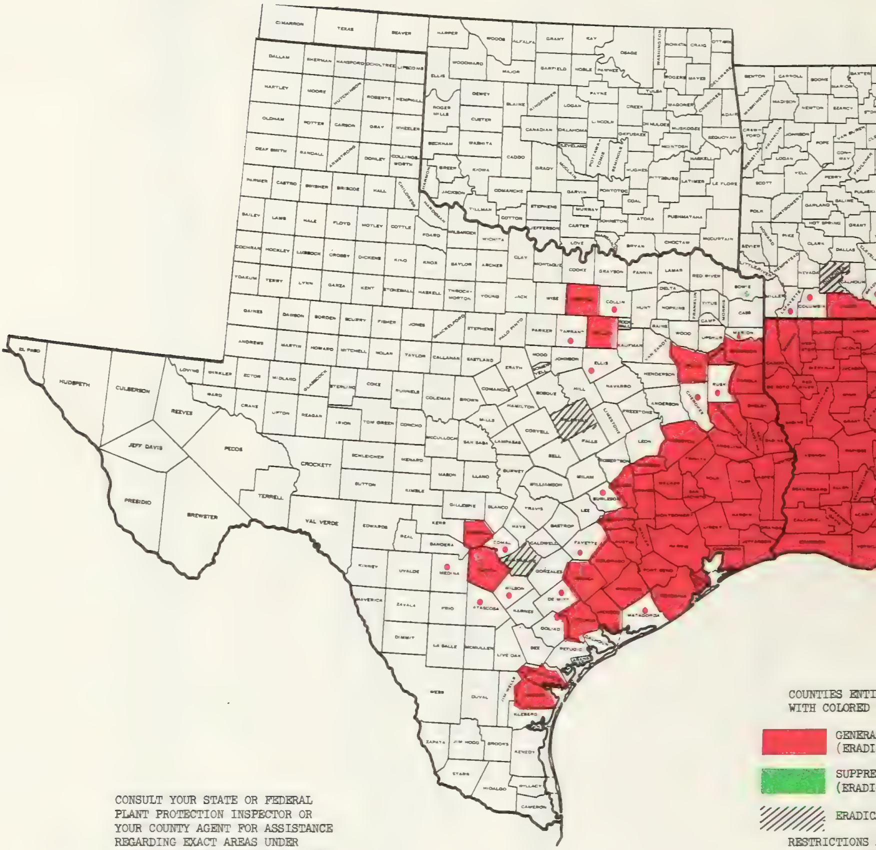

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YOUR COUNTY AGENT FOR ASSISTANCE
REGARDING EXACT AREAS UNDER
REGULATION AND REQUIREMENTS FOR
MOVING REGULATED ARTICLES.
FOR DETAILED INFORMATION CONSULT
7 CFR 301.81 FOR QUARANTINE AND
REGULATIONS.

REVISED SEPTEMBER 13, 1974

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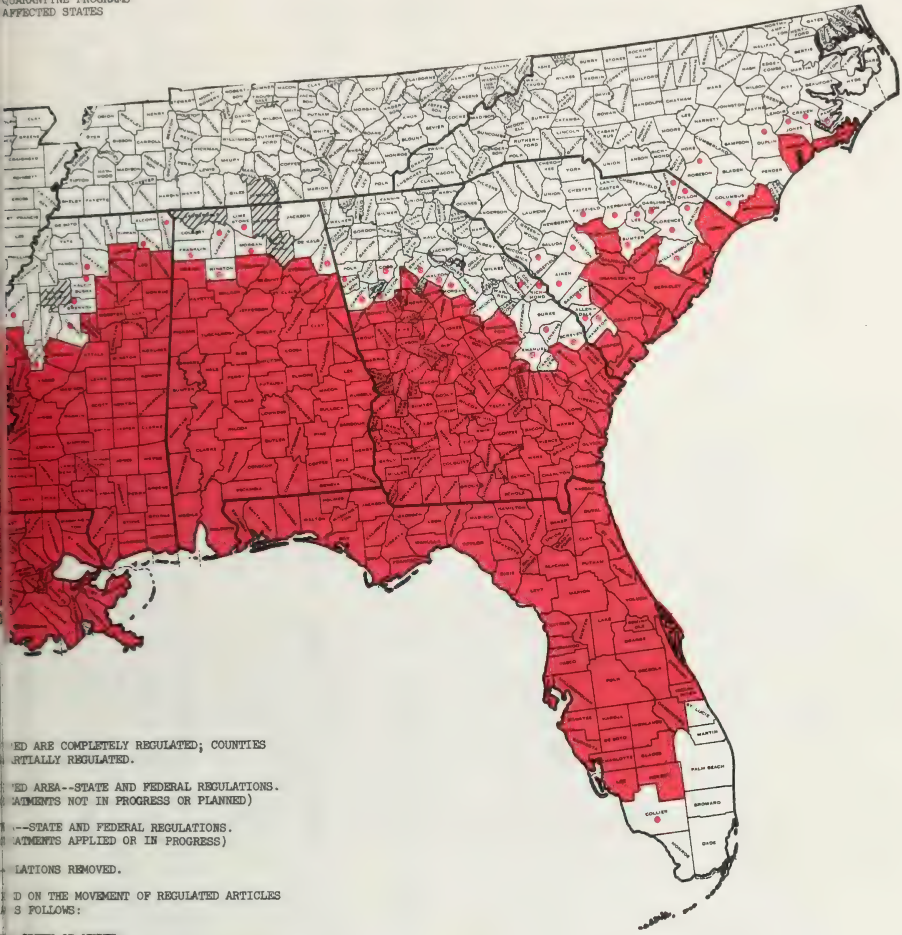
AFFECTED STATES



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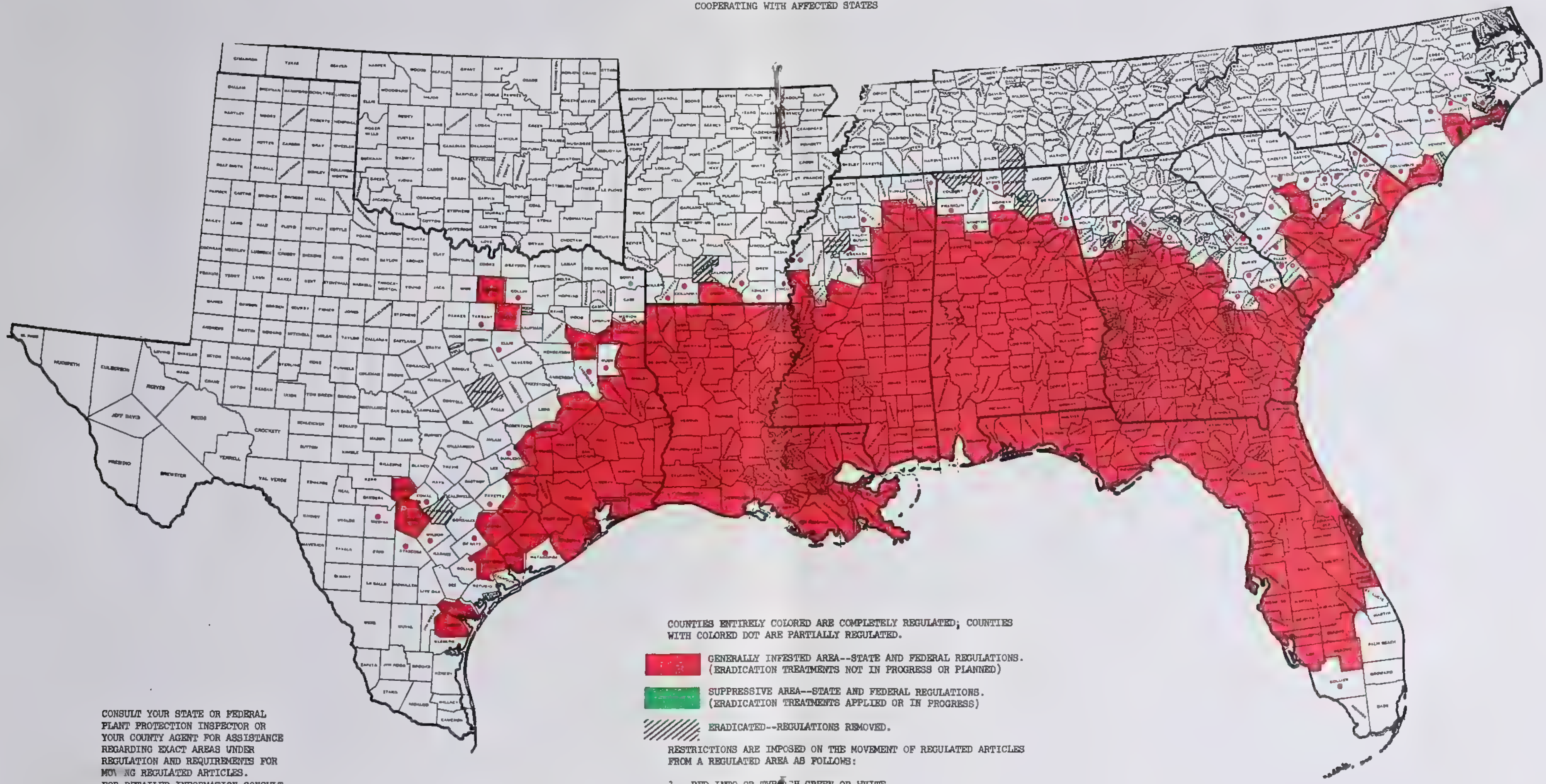
FOR LIST OF REGULATED ARTICLES.)

IMPORTED FIRE ANT QUARANTINES

U.S. DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
PLANT PROTECTION AND QUARANTINE PROGRAMS
COOPERATING WITH AFFECTED STATES



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🟥 GENERALLY INFESTED AREA--STATE AND FEDERAL REGULATIONS. (ERADICATION TREATMENTS NOT IN PROGRESS OR PLANNED)

🟩 SUPPRESSIVE AREA--STATE AND FEDERAL REGULATIONS. (ERADICATION TREATMENTS APPLIED OR IN PROGRESS)

▨ ERADICATED--REGULATIONS REMOVED.

RESTRICTIONS ARE IMPOSED ON THE MOVEMENT OF REGULATED ARTICLES FROM A REGULATED AREA AS FOLLOWS:

1. RED INTO OR THROUGH GREEN OR WHITE.
2. GREEN INTO OR THROUGH WHITE.
3. GREEN INTO GREEN.
4. GREEN WITHIN GREEN.*

*WHEN IT IS DETERMINED BY THE INSPECTOR THAT A HAZARD OF SPREAD EXISTS.

(SEE REVERSE SIDE FOR LIST OF REGULATED ARTICLES.)

CONSULT YOUR STATE OR FEDERAL PLANT PROTECTION INSPECTOR OR YOUR COUNTY AGENT FOR ASSISTANCE REGARDING EXACT AREAS UNDER REGULATION AND REQUIREMENTS FOR MOVING REGULATED ARTICLES.
FOR DETAILED INFORMATION CONSULT 7 CFR 301.81 FOR QUARANTINE AND REGULATIONS.

REVISED SEPTEMBER 13, 1974

cleaned of all loose, noncompacted soil.

6. Any other products, articles, or means of conveyance of any character whatsoever, not covered by the above, when it is determined by an inspector that they present a hazard of spread of the imported fire ant and the person in possession thereof has been so notified.

* Information as to approved laboratories may be obtained from an inspector.

** Exempt if not exposed to infestation after cleaning or other prescribed handling.

Fruits and Ornamentals

LARGE MANGO TIP BORER (*Bombotelia jocosatrix*) ranged light to moderate on Oahu, Maui, and Hawaii Islands through the period of flush growth. Damage to mango trees was minor. Moderate to heavy BANANA SKIPPER (*Erionota thrax*) infestations were predominant in banana plantings on leeward Oahu from January through March. By June, infestations and damage were heavy along the north shore. During late summer, infestations and damage increased on the windward side of Oahu. Very heavy populations and severe damage occurred in 10+ acres of banana at Waiahole, and remained so through November. Surveys during November showed *E. thrax* populations and damage were light throughout leeward and north shore areas of Oahu. *Ooencyrtus erionotae* (an encyrtid wasp), an egg parasite of *E. thrax*, and *Apanteles erionotae* (a braconid wasp), a larval parasite, exerted control of banana skipper in these areas. COCONUT LEAFROLLER (*Hedylepta blackburni*) severely damaged coconut during midspring and early summer at many locales in leeward and north shore areas of Oahu. By late summer, most trees had recovered and new foliage appeared free of damage. CITRUS SWALLOWTAIL (*Papilio xuthus*) populations and damage were variable on Oahu throughout the year. This butterfly was found for the first time on Maui at Wailuku, on Hawaii at Kailua-Kona, and on Molokai. where it is widespread. Lanai is the only island where this butterfly is not established. BLACK PARLATORIA SCALE (*Parlatoria zizyphus*) ranged light to moderate on citrus throughout Makaha, Oahu. An ARMORED SCALE (*Phenacaspis cockerelli*) ranged light to moderate on oleander, plumeria, bird-of-paradise, and mango during late spring and summer on Maui, and on oleander throughout the year on Oahu. REDBANDED THRIPS (*Selenothrips rubrocinctus*) was periodically light to moderate during summer on mango on Maui and Oahu, and on macadamia at Pahala, Hawaii Island. BLACK CITRUS APHID (*Toxoptera aurantii*) was periodically heavy on Oahu throughout the year. Several species of lady beetles were found on infested trees and appeared to exert good control of aphid outbreaks. Infestations of a BARK BEETLE (*Xylosandrus compactus*) ranged light to moderate on mango and avocado at Naalehu, Hawaii Island, in April, and were moderate on *Melochia umbrellata* in the Waiakea Forest Reserve at Hilo. *X. compactus* was found for the first time on Molokai at Palaau infesting twigs of kiawe (*Prosopis pallida*).

Man and Animals

MOSQUITO collections were made from about 70 light traps operated on Oahu during the period January through September. *Aedes vexans nocturnus* females averaged 11 (range 4-22) per month, with highest monthly averages taken during January, February, and April. This average is about twice that for the same period in 1972. *Culex pipiens quinquefasciatus* (southern house mosquito) females averaged 113 (range 21-244) per month, with high monthly averages recorded for all months except March, April, May, and June. This average was also about twice that for the same period in 1972. Three AMERICAN DOG TICK (*Dermacentor variabilis*) females were collected from dogs during July and August at the animal quarantine facility at Halawa, Oahu. A small animal survey was conducted at the facility, but no additional specimens were found. This tick apparently is not established, but was intercepted on newly arrived dogs.

Beneficial Insects

A BRACONID WASP (Apanteles erionotae), a larval parasite, and an ENCYRTID WASP (Ooencyrtus erionotae), an egg parasite, decreased populations of Erionota thrax (banana skipper) in banana throughout leeward and north shore areas of Oahu. O. erionotae was particularly effective, with 90-100 percent egg parasitism achieved within 3-5 months after release. Larval parasitism by A. erionotae was variable. Two releases of an ICHNEUMON WASP (Scenocharops sp.), another larval parasite of E. thrax, were made in November and December. Monthly surveys on Kauai and Maui showed that BRACONID WASPS (Opius importatus and O. phaseoli) and a PTEROMALID WASP (Halticoptera patellana), parasites of Ophiomyia phaseoli (bean fly), provided excellent control of the pest in home bean plantings. A GALL FLY (Procecidochares alani) was released in April at Kaupulehu, Hawaii Island, for the control of Hamakua pamakani (Ageratina riparia) on rangeland. It has since been established at several locations in the Volcano and Kona areas. A PTEROPHORID MOTH (Oidaematophorus sp.), released for the same purpose, failed to become established at most, if not all, release sites. Nine releases (total of 2,000 adults) of a PLATYGASTERID WASP (Amitis hesperidum) were made on roses at Kapahulu, Oahu, during the period August through November for control of Aleurocanthus spiniferus (orange spiny whitefly), but has not become established. Four releases of an ENCYRTID WASP (Prospaltella smithi) (total of 168 adults) were made in the same area during the same period, and appears to be established at one site. Adults and larvae of a LADY BEETLE (Serangium maculigerum) were observed feeding on nymphs and pupae of A. spiniferus, but not frequently. Control efforts for this whitefly are continuing. Larvae of an ARCTIID MOTH (Selca brunella) have given only fair control of Melastoma sp.

"Lovebugs," a Review of the Nearctic Species of Plecia Wiedemann (Diptera: Bibionidae)

F. Christian Thompson 1/

Since the mid-1960's "lovebugs" have become a great nuisance in some of the Southeastern States, particularly Florida. The adults emerge in late spring and early fall in such large numbers that they literally foul up everything. The common name, "lovebug," is derived from their habit of flying in copula. The larvae are found in and on the soil under decaying vegetation on which they feed. Thus, the larvae perform a beneficial function by converting dead vegetation into humus (Hetrick, 1970a, 1970b). Hetrick in his study on the biology of the "lovebug" in Florida noted no natural checks on the immature stages and that most predators avoided the adult flies. Many interesting and essential questions remain unanswered about the "lovebug." However, the first step is to establish the correct identity of the species involved. As a contribution to this first step, the results of a study to verify the previous determinations of the Florida "lovebug" are presented so as to enable others to identify their "lovebugs."

The "lovebug" belongs to the genus Plecia Wiedemann of the dipterous family Bibionidae. Plecia is a large genus of more than 200 species of mainly pantropical distribution, but a few species do occur in both the northern and southern temperate regions. Only two species of Plecia are known to occur in the United States, and they are americana Hardy (1940:15) and nearctica Hardy (1940:20).

The ranges of both species appear to be mainly restricted to the areas bordering the Gulf of Mexico, with americana extending northeastward to North Carolina and nearctica southward to Guatemala. When Hardy (1940) described these species, americana was apparently common only in Florida, and nearctica was unknown east of Mississippi. P. nearctica is now abundant in Florida, and the present status of americana is unknown.

The familial characteristics of the "lovebug" are: (a) antenna with 7 to 12 segments; (b) head with ocelli present; (c) wing without discal cell (1st M2); (d) wing with the costa ending at or before the wing tip; (e) wing with a large anal area; and (f) wing with a second basal cell (M). These characteristics have been listed in order of importance in terms of distinguishing bibionid flies from all other Diptera, but all these characteristics should be checked to insure accurate identification of the family.

The definitive generic characteristics of the "lovebug" are that (g) the radial sector (Rs) of the wing is branched, and the upper branch (R 2+3) is very short.

The two Nearctic species of Plecia can be separated by the color of the thorax and the shape of the face as outlined below. Both of these species are readily separated from all the other Plecia species by their distinctive genitalia. The genital characteristics

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1/ Systematic Entomology Laboratory, IIBIII, ARS, USDA. Mailing address: c/o U.S. National Museum, Smithsonian Institution, Washington, D.C. 20560 mentioned below and figured can be seen in untreated specimens. However, dried material is frequently shriveled or otherwise distorted. In these cases the tip of the abdomen should be removed and macerated for about a minute in a freshly made 10-percent solution of sodium or potassium hydroxide.

Key to the Nearctic species of Plecia Wiedemann

Thorax with dorsum rufous and pleura extensively black; head with oral margin distinctly produced forward (figs. 1, 3). Male genitalia with 9th tergum (fig. 9) not as broad as in americana, just slightly broader than long, with shallow medial excavation and ventromedial flap, not produced ventrolaterally; 9th sternum (fig. 11) with dorsolateral lobe extending under 9th tergum, produced ventromedially into a narrow forked process; telomeres (fig. 7) large, L-shaped in lateral view. Female genitalia with 9th tergum (figs. 12, 14) large, almost completely concealing cerci in lateral view, strongly excavated dorsomedially; cerci (fig. 14) small, narrow in dorsal view; 8th sternum (figs. 12, 16) small, with a shallow medial excavation; ovipositor lobes broad, blunt apically and strongly sclerotized dorsally . . . . nearctica Hardy

Thorax almost completely rufous, rarely slightly brownish black on metathoracic pleura; head with oral margin not produced forward, but evenly convex (figs. 2, 4). Male genitalia with 9th tergum (fig. 8) much broader than in nearctica, almost twice as broad as long, with a deep medial excavation and without a ventromedial flap, ventrolateral corners produced posteriorly; 9th sternum (fig. 10) with a dorsolateral lobe, not produced ventromedially and without a medial forked process, but with a broad ventromedial excavation; telomeres (fig. 6) small, almost completely round. Female genitalia with 9th tergum (figs, 13, 15) small, not concealing cerci in lateral view, not excavated medially; cerci (fig. 15) large, broad in dorsal view; 8th sternum large, with a deep and narrow medial excavation; ovipositor lobes narrow, acute apically, not strongly sclerotized dorsally . . . . americana Hardy

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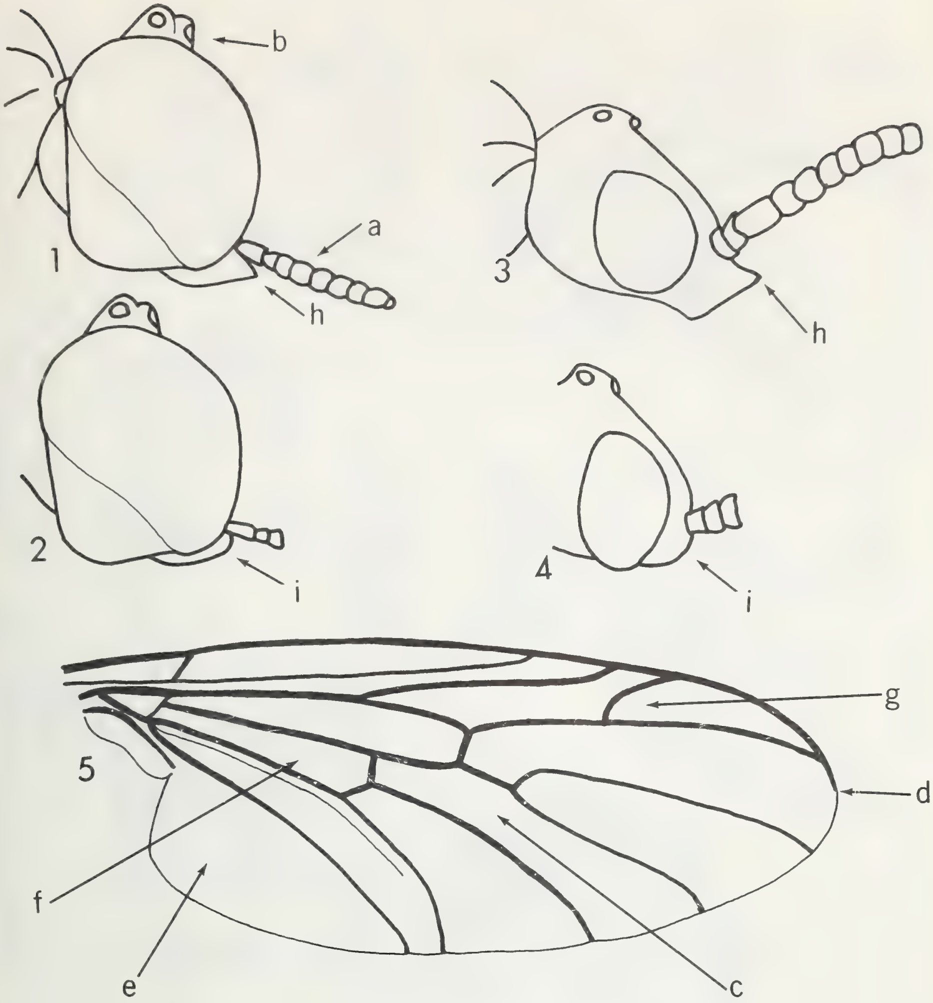
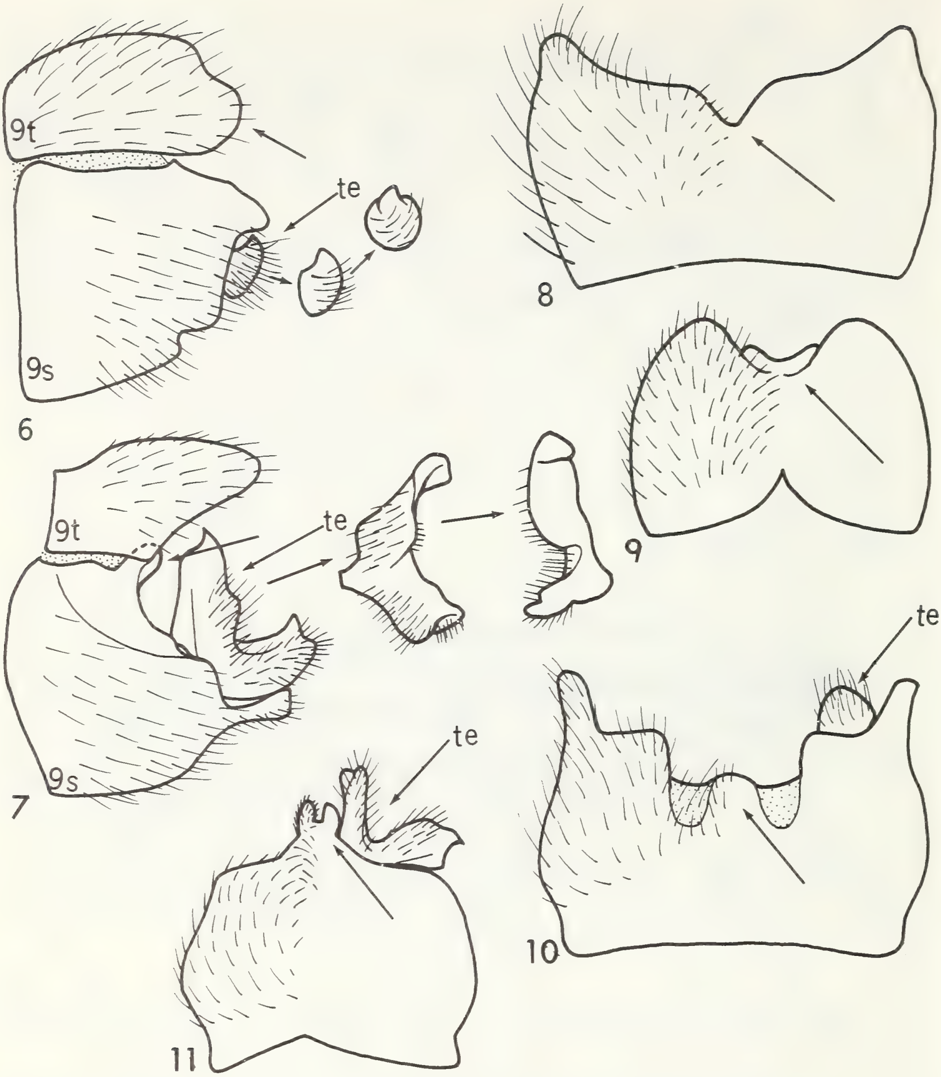
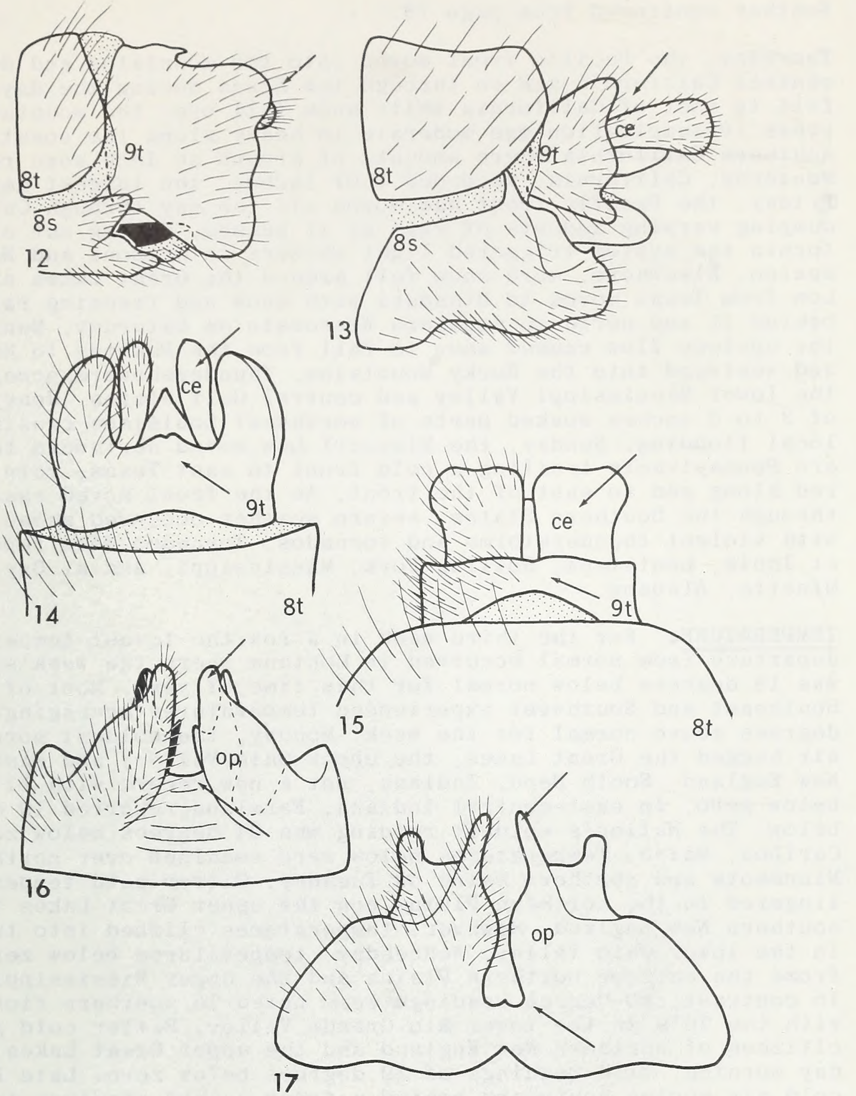


Figs.1-5. Figs. 1-4. Heads of *Plecia*, lateral view; 1. *nearctica* Hardy, male; 2. *americana* Hardy, male; 3. *nearctica* Hardy, female; 4. *americana* Hardy, female. 5. wing of *Plecia nearctica* Hardy. The small letters refer to the characteristics discussed in the text.



Figs. 6-11. Male genitalia of Plecia. Figs. 6-7. 9th abdominal segment and assoicated structures, lateral view, with additional posterolateral and posteromedial views of the right telomere; 6. americana Hardy; 7. nearctica Hardy. 8-9. 9th tergum, dorsal view; 8. americana Hardy; 9. nearctica Hardy. 10-11. 9th sternum with left telomere attached, ventral view; 10. americana Hardy; 11. nearctica Hardy. 9t = 9th tergum, 9s = 9th sternum, te = telomere; the arrows point to the characteristics mentioned in the key.



Figs. 12-17. Female genitalia of Plecia. Figs. 12-13. 8th and 9th abdominal segments and associated structures, lateral view; 12. nearctica Hardy; 13. americana Hardy. 14-15. 8th and 9th terga and associated structures, dorsal view; 14. nearctica Hardy; 15. americana Hardy. 16-17. 8th sternum, ventral view; 16. nearctica Hardy; 17. americana Hardy. 8t = 8th tergum, 8s = 8th sternum, 9t = 9th tergum, ce = cercus, op = ovipositor lobe; the arrows point to the characteristics mentioned in the key.

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Weather continued from page 78.

Thursday, the Pacific front moved into the mountains and down into central California and on through the State during the day. Rain fell in most of California while snow fell over the mountainous areas. Precipitation was moderate to heavy along the coast of southern California where amounts of around an inch were reported. Monterey, California, recorded 1.07 inches, the largest amount. Friday, the Pacific front had moved all the way through California dumping varying amounts of rain as it passed. Moving out of California the system triggered light showers in Arizona and New Mexico. Elsewhere, more snow fell around the Great Lakes area. A Low from Texas moved to Missouri with snow and freezing rain behind it and north to southern Wisconsin on Saturday. Meanwhile, the upslope flow caused snow to fall from the Dakotas to Kansas and westward into the Rocky Mountains. Thundershowers occurred in the lower Mississippi Valley and central Gulf States. Heavy rains of 3 to 6 inches soaked parts of northwest Louisiana causing local flooding. Sunday, the Missouri Low moved northward to western Pennsylvania trailing a cold front to east Texas, rain occurred along and to east of the front. As the front moved eastward through the Southern States, severe weather occurred ahead of it with violent thunderstorms and tornados. Tornados were reported at Innis, Louisiana, Rolling Fork, Mississippi, and at Bay Minette, Alabama.

TEMPERATURE: For the third week in a row the lowest temperature departure from normal occurred in Montana where the week's average was 18 degrees below normal for this time of year. Most of the Southeast and Southwest experienced temperatures averaging 1 to 8 degrees above normal for the week. Monday, the coldest morning air hugged the Great Lakes, the upper Ohio Valley, and east into New England. South Bend, Indiana, set a new record with 11 degrees below zero. In east-central Indiana, Farmland reported 19 degrees below. The Nation's coldest reading was 24 degrees below zero at Caribou, Maine. Temperatures below zero remained over northern Minnesota and northern Maine on Tuesday. Bitter cold temperatures lingered in the northern Plains and the upper Great Lakes to southern New England. However, temperatures climbed into the 40's in the lower Ohio Valley. Wednesday, temperatures below zero froze the extreme northern Plains and the upper Mississippi Valley. In contrast, 80-degree readings were noted in southern Florida with the 70's in the lower Rio Grande Valley. Bitter cold greeted citizens of northern New England and the upper Great Lakes, Thursday morning, with readings of 19 degrees below zero. Late Friday, cold air moving southward behind a front pushed readings in Montana and North Dakota to below zero while the teens spread as far south as Nebraska. Just south of the front in eastern Texas the mercury held in the 60's. Temperatures also dipped to near zero in northern New England and northeastern New York. An extremely sharp temperature contrast occurred across the cold front in Texas on Saturday. McAllen, in the southern part of the State, soared to 98 degrees, while Amarillo in the Panhandle only reached 27 degrees. Sunday, afternoon temperatures around the Nation ranged from 5 degrees above zero at Butte and Bozeman, Montana, to 85 degrees at Fort Myers, Florida.

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